BIO-MEDICAL MATERIALS AND ENGINEERING

AN INTERNATIONAL JOURNAL

Volume 4, 1994
Contents and Indexes

BIO-MEDICAL MATERIALS AND ENGINEERING

An International Journal

Editor-in-Chief

Takeo Yokobori

School of Science and Engineering
Teikyo University
Toyosatodai 1-1
Utsunomiya 320
Japan

Honorary Editors

E. Y. S. Chao
Johns Hopkins Orthopaedic Surgery
The Ross Research Building
720 Rutland Avenue, Rm. 225
Baltimore, MD 21205-2196
USA

Y. Nosé
Department of Surgery
Baylor College of Medicine
Texas Medical Center
One Baylor Plaza
Houston, TX 77030
USA

Executive Editors

H. Aoki
Institute for Medical & Dental Engineering
Tokyo Medical and Dental University
2-3-10 Kanda-surugadai
Chiyoda-ku, Tokyo #101
Japan

C. R. McMillin
AcroMed Corporation
3303 Carnegie Avenue
Cleveland, OH 44115
USA

A. T. Yokobori, Jr.
Department of Mechanical Engineering II
Tohoku University
Aoba, Aramaki, Sendai, #980
Japan

Editorial Advisory Board

J. C. Barbenel (University of Strathclyde, UK)
P. Calvert (University of Arizona, USA)
A. U. Daniels (Osteonics, Inc., USA)
G. Drouin (École Polytechnique, Canada)
B. Dupuy (Université de Bordeaux II, France)
U. M. Gross (Klinikum Steglitz der Freien Universität Berlin, Germany)
H. Hamanaka (Tokyo Medical and Dental University, Japan)
H. Harasaki (The Cleveland Clinic Foundation, USA)
K. Hayashi (Hokkaido University, Japan)
Y. Ikada (Kyoto University, Japan)
H. Kambic (The Cleveland Clinic Foundation, USA)
I. Karube (University of Tokyo, Japan)
J. L. Katz (Case Western Reserve University, USA)
V. F. Lee (Lee Offices, USA)
J. E. Lemons (University of Alabama, USA)
P. van Mullem (University of Nijmegen, The Netherlands)
S. Niwa (Aichi Medical University, Japan)
Y. Ooi (Jichi Medical School, Japan)
Y. Oshida (Indiana University, USA)
J. B. Park (University of Iowa, USA)
H. Plenk (Institut–Der Universität Wien, Austria)
J. M. Price (Faegre & Benson, USA)
Y. Shirai (Nippon Medical University, Japan)
D. C. Smith (University of Toronto, Canada)
T. Tateishi (MITI, Japan)
J. F. V. Vincent (The University of Reading, UK)
H. Watanabe (Kyoto Furitsu Medical University, Japan)
R. A. White (Harbor-UCLA Medical Center, USA)
D. F. Williams (The University of Liverpool, UK)
L. H. Yahia (École Polytechnique, Canada)

Production Editor: Jill Maley, E-mail Address: J.MALEY@ELSEVIER.COM

Editorial Offices: *Bio-Medical Materials and Engineering,* Professor Takeo Yokobori, Editor-in-Chief, School of Science and Engineering, Teikyo University, Toyosatodai 1-1, Utsunomiya 320, Japan.

Publishing, Subscription and Advertising Offices: Elsevier Science Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, USA, E-mail Address: ESUK.USA@ELSEVIER.COM; Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK.

Published 4 issues per annum. Annual Institutional Subscription Rates 1995: North, Central and South America, U.S. $425.00, Rest of World £285.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

Pergamon

Bio-Medical Materials and Engineering, Vol. 4, No. 7, 513–523, 1994
Copyright © 1994 Elsevier Science Ltd
Printed in the USA. All rights reserved
0959-2989/94 $6.00 + .00

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 1 1994

CONTENTS

Mark A. Babizhayev **Nikolai A. Chumayevskii**	Tinting Effect of Ultraviolet Radiation on Intraocular Lenses of Polymethyl Methacrylate	1
L. Torrisi	Microfilters by Laser Processing of Bio-Polymers	17
Takao Nakamura **Kozaburo Hayashi** **Katsuhiko Hirano** **Takeo Matsumoto**	Determinant Factors of Efficiency of a Motor-Driven Ventricular Assist Device	27
Yong S.Kim **Yoon H. Kang** **Jeong K. Kim** **Joon B. Park**	Effect of Bone Mineral Particles on the Porosity of Bone Cement	37
N. Tomita **S. Tamai** **K. Ikeuchi** **Y. Ikada**	Effects of Cross-Sectional Stress-Relaxation on Handling Characteristics of Suture Materials	47
Katsunari Nishihara **Tsuyoshi Tange** **Kazushi Hirota** **Kiyoshi Kawase**	Development of Hybrid Type Artificial Bone Marrow Using Sintered Hydroxyapatite	61

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 2 1994

Special Issue

A Selection of Papers from the
International Symposium on Advanced Bio-Materials and Engineering '93
(ISABE '93)

CONTENTS

Takeo Yokobori	Preface	67
Takeo Yokobori	What Are Biomechanics and Biomechanical Behaviour?	69
Hiromi Yoshinari **A. Toshimitsu Yokobori, Jr.** **Tsuneo Ohkuma**	Theoretical Foundation on a Noninvasive Estimation for Viscoelastic Mechanical Property of Blood Vessels by Ultrasonic Doppler Effect	77
A. Toshimitsu Yokobori, Jr. **Tsuneo Ohkuma** **Shigeru Sasaki** **Hiromi Yoshinari** **Takeo Yokobori** **Hiroshi Ohuchi** **Shozo Mori**	Algorithm of the Noninvasive Diagnosis Method on the Atherosclerosis by Ultrasonic Doppler Effect	87
Shigeru Sasaki **A. Toshimitsu Yokobori, Jr.** **Tsuneo Ohkuma**	CAE Software for the Noninvasive Diagnosis Method on the Atherosclerosis by Ultrasonic Doppler Effect	97
M. Nakayama **K. Tanishita**	Measurement of Thermal Diffusivity of Biomaterials by Focused Ultrasonic Beams (Thermal Pulse Decay Method by Focused Ultrasonic Beams)	105
Masanobu Ujihira **Naoki Aizawa** **Kazuo Tanishita**	Study on Freezing Process of Killifish Egg: Utilizing the Undercooled State for Cryopreservation	115
Tadanori Azuma **Masaya Niiro** **Hirotetsu Motobu**	Removal of Pesticides from Wastewater at Golf Courses Using Plants (Removal by Mung Beans; *Phaseolus radiatus L*)	127

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 3 1994

Special Issue

A Selection of Papers from the
International Symposium on Advanced Bio-Materials and Engineering '93
(ISABE '93)

CONTENTS

Takeo Yokobori	Preface	139
Katsunari Nishihara **Shigeru Nakagiri**	Biomechanical Studies on Newly Tailored Artificial Dental Root	141
Katsunari Nishihara **Shigeru Nakagiri**	Biomechanical Research on Junction System of Bone with Biomaterials	151
Katsunari Nishihara	Application of Bioactive Ceramics for Functional Surgery in Masticatory Organs	161
H. J. Kim **R. S. Benson**	The Effects of Soft Segment Structure on the Fatigue Crack Propagation of Model Polyurethanes	171
E. G. Nordström **B. E. Södergård** **L. Kukkonen**	Thin Sol-Gel-Derived Silica Coatings on CP-Titania and Bioactivity Thereupon	187
Gary Maharaj **Stefan Bleser** **Kathryn Albert** **Richard Lambert** **Shilesh Jani** **Russell Jamison**	Characterization of Wear in Composite Material Orthopaedic Implants Part I: The Composite Trunnion/Ceramic Head Interface	193
K. Albert **R. Schledjewski** **M. Harbaugh** **S. Bleser** **R. Jamison** **K. Friedrich**	Characterization of Wear in Composite Material Orthopaedic Implants Part II: The Implant/Bone Interface	199

(Continued)

J. A. Davidson **R. A. Poggie** **A. K. Mishra**	Abrasive Wear of Ceramic, Metal, and UHMWPE Bearing Surfaces from Third-Body Bone, PMMA Bone Cement, and Titanium Debris	213
J. A. Davidson **A. K. Mishra** **P. Kovacs** **R. A. Poggie**	New Surface-Hardened, Low-Modulus, Corrosion-Resistant Ti-13Nb-13Zr Alloy for Total Hip Arthroplasty	231
D. L. Bader **G. E. Kempson**	The Short-Term Compressive Properties of Adult Human Articular Cartilage	245

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 4 1994

Special Issue

A Selection of Papers from the
International Symposium on Advanced Bio-Materials and Engineering '93
(ISABE '93)

CONTENTS

Takeo Yokobori	Preface	257
Lito C. Mejia **Thomas J. Brierley**	A Hip Wear Simulator for the Evaluation of Biomaterials in Hip Arthroplasty Components	259
Masamizu Ohyama **Yoshinori Miyasaka** **Minoru Sakurai** **A. Toshimitsu Yokobori, Jr.** **Shigeru Sasaki**	The Mechanical Behavior and Morphological Structure of Callus in Experimental Callotasis	273
Seisuke Kano **Atsushi Yamazaki** **Ryohei Otsuka** **Masataka Ohgaki** **Masaru Akao** **Hideki Aoki**	Application of Hydroxyapatite-Sol as Drug Carrier	283
Akihide Kamegai **Norimasa Shimamura** **Katsumi Naitou** **Kuniteru Nagahara** **Nobutake Kanematsu** **Masahiko Mori**	Bone Formation Under the Influence of Bone Morphogenetic Protein/Self-Setting Apatite Cement Composite as a Delivery System	291
E. G. Nordström **H. Herø** **R. B. Jørgensen**	Mechanical Properties of Hydroxyapatite/Mica Composite	309
A. Ungersböck **O. Pohler** **S. M. Perren**	Evaluation of the Soft Tissue Interface at Titanium Implants with Different Surface Treatments: Experimental Study on Rabbits	317

(*Continued*)

Hiroshi Oshima **Masaaki Nakamura**	A Study on Reference Standard for Cytotoxicity Assay of Biomaterials	327
Hiromi Yoshinari **A. Toshimitsu Yokobori, Jr.**	Mechanical Test Methods for Biomedical Membranes	333
Takeo Yokobori	Some Philosophies for Standardizations of Biomaterials and Related Devices	341
K. Albert	ISABE '93 Panel Discussion Review: Why and How to Standardize Testing for Biomaterials and Related Devices	345

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 5 1994

CONTENTS

L'Hocine Yahia **Sylvie Lombardi** **Amine Selmani** **Gilbert Drouin** **Mohamed Hlaouti**	Effect of Plasma Treatment on Tribological Properties of Synthetic Ligaments	347
Makoto Otsuka **Yoshihisa Matsuda** **Jer Hsu** **Jeffery L. Fox** **William I. Higuchi**	Mechanochemical Synthesis of Bioactive Material: Effect of Environmental Conditions on the Phase Transformation of Calcium Phosphates During Grinding	357
Gladius Lewis	Use of Enzyme-Linked Immunosorbent Assay (ELISA) for Detection and Quantification of Monoclonal Antibodies	363
Jeong K. Kim **Joon B. Park**	Reinforcement of Bone Cement Around Prostheses by Pre-Coated Wire Coil: A Preliminary Study	369
Jaroslav Valenta **Milan Růžička** **Radomír Čihák**	Modelling Tissue Behaviour Based on Hyperelasticity Theory	381
Y. Oshida **A. Hashem** **T. Nishihara** **M. V. Yapchulay**	Fractal Dimension Analysis of Mandibular Bones: Toward a Morphological Compatibility of Implants	397

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 6 1994

CONTENTS

F. K. Lam **F. H. Y. Chan** **P. W. F. Poon** **W. Qiu** **B. Z. Xu**	Visual Evoked Potential Measurement by Adaptive Filtering	409
Craig J. Hoff **Wen-Jei Yang**	A Review of Pulse Propagation in Viscoelastic Arteries with Distributed Flow Leakage	419
Michio Ito **Akimichi Miyazaki** **Toshio Yamagishi** **Hiroshi Yagasaki** **Azza Hashem** **Yoshiki Oshida**	Experimental Development of a Chitosan-Bonded β-Tricalcium Phosphate Bone Filling Paste	439
Jeong K. Kim **Joon B. Park** **James N. Weinstein** **John L. Marsh** **Yong S. Kim** **Stefan A. H. Loening**	Effect of Shock Wave Treatment on Femoral Prosthesis and Cement Removal	451

BIO-MEDICAL MATERIALS AND ENGINEERING
An International Journal

Volume 4 Number 7 1994

CONTENTS

W. A. B. Wan Abas **M. Ridzuan Asseli**	Modelling the Mechanical Response of Skin *In Vivo* Using the Bossinesq and the Michell Stress Functions	463
W. A. B. Wan Abas	Biaxial Tension Test of Human Skin *In Vivo*	473
Takao Nakamura	Morphological Change in Myocardium in Goat Recovered from Profound Left Ventricular Failure with Cardiac Assist Device	487
Gladius Lewis	A Parametric Finite Element Analysis Study of the Stresses in an Endosseous Implant	495
Jiao Sun **Miao Xue** **Masanori Kikuchi** **Masaru Akao** **Hideki Aoki**	Effects of Sr-Hydroxyapatite Microcrystal on Cultured Cell	503
	Volume 4, 1994 Contents and Indexes	513